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**Nombre del trabajo: INTEGRALES 4**

**Materia: Matemáticas Aplicadas**

**Grado: 6to cuatrimestre**

**Grupo: “A”**

Comitán de Domínguez Chiapas a 31 de julio de 2022.

1.- $\int \frac{dx}{16x^2+4} =$

fórmula: $\int \frac{dv}{v^2+a^2} = \frac{1}{a}\arctan\frac{v}{a} + c$

$\frac{1}{4}\int \frac{d(4x)}{(4x)^2+2^2}$

$= \frac{1}{4}\cdot\frac{1}{2}\arctan\frac{4x}{2} + c$

$= \boxed{\frac{1}{8}\arctan 2x + c}$

2.- $\int \frac{dx}{\sqrt{25x^2+1}} =$

fórmula: $\int \frac{dv}{\sqrt{v^2 \pm a^2}} = \ln|v + \sqrt{v^2 \pm a^2}| + c$

$\frac{1}{5}\int \frac{d(5x)}{(5x)^2+1}$

$\boxed{\int \frac{1}{5}\ln|5x + \sqrt{25x^2+1}| + c}$

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3.- $\int \frac{dx}{36-x^2} =$

fórmula: $\int \frac{dv}{\sqrt{v^2 \pm a^2}} = \ln|v + \sqrt{v^2 \pm a^2}| + c$

$\frac{1}{1}\int \frac{d(x)}{6-(x)^2}$

$= \frac{1}{1}\cdot\frac{1}{12}\ln\left|\frac{x+6}{x-6}\right| + c$

R= $\boxed{= \frac{1}{12}\ln\left|\frac{x+6}{x-6}\right| + c}$

4.- $\int \frac{dx}{\sqrt{4-4x^2}} =$

fórmula: $\int \frac{dv}{\sqrt{a^2-v^2}} = \operatorname{arcsen}\left(\frac{v}{a}\right) + c$

$\frac{1}{2}\int \frac{d(2x)}{\sqrt{2^2-(2x)^2}}$

R= $\boxed{= \frac{1}{2}\cdot \operatorname{arc\,sen}\left(\frac{2x}{2}\right) + c}$

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5.- $\int \frac{dx}{2x\sqrt{4x^2-16}} =$

fórmula: $\int \frac{dv}{v\sqrt{v^2-a^2}} = \frac{1}{a}\operatorname{arc\,sec}\frac{v}{a}$

$v^2 = 4x^2$ $a^2 = 16$

$v = 2x$ $a = 4$

$dv = 2$

R= $\boxed{= \frac{1}{4}\operatorname{arcsec}\frac{2x}{4} + c}$

6.- $\int \sqrt{25-25}\,dx =$

fórmula: $\int \sqrt{a^2-v^2}\,dv = \frac{v}{2}\sqrt{a^2-v^2} + \frac{a^2}{2}\operatorname{arc\,sen}\frac{v}{a}$

$v^2 = 25x^2$ $a^2 = 25$

$v = 5x$ $a = 5$

$dv = 5dx$

$= \frac{1}{5}\int \sqrt{25-25}\,5dx$

$= \frac{1}{5}\left(\frac{5x}{2}\sqrt{25-25x^2} + \frac{25}{2}\operatorname{arc\,sen}\frac{5x}{5} + c\right.$

R= $\boxed{\frac{x}{2}\sqrt{25-25x^2} + \frac{25}{10}\operatorname{arc\,sen}\frac{5x}{5} + c}$

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7.- $\int \sqrt{x^2=49dx} =$

fórmula: $\int \sqrt{v^2 \pm a^2}\,dv = \frac{v}{2}\sqrt{v^2 \pm a^2} \pm \frac{a^2}{2}\ln|v + \sqrt{v^2 \pm a^2}| + c$

$\int \sqrt{(x)^2 - 4d(x)}$

$\boxed{\frac{1}{1}\int\left[\frac{x}{2}\sqrt{x^2-49} - \frac{49}{2}\ln|x + \sqrt{x^2-49}| + c\right]}$

8.- $\int \frac{dx}{4x^2-25} =$

fórmula: $\int \frac{dv}{v^2-a^2} = \frac{1}{2a}\ln\left|\frac{v-a}{v+a}\right|$

$= \frac{1}{2}\int \frac{2dx}{4x^2-25}$

$v^2 = 4x^2$ $a^2 = 25$

$= \frac{1}{2}\left(\frac{1}{2(5)}\right)\ln\left|\frac{2x-5}{2x+5}\right| + c$

$v = 2x$ $a = 5$

$dv = 2dx$

R= $\boxed{\frac{1}{20}\ln\left|\frac{2x-5}{2x+5}\right| + c}$

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9.- $\int \frac{dx}{\sqrt{36x^2-1}} =$

FÓRMULA: $\int \frac{dv}{\sqrt{v^2 \pm a^2}} = \ln|v + \sqrt{v^2 \pm a^2}| + c$

$\frac{1}{6}\int \frac{d(6x)}{\sqrt{(6x)^2-1}}$

R= $\boxed{\frac{1}{6}\ln|6x + \sqrt{36x^2-1}| + c}$

10.- $\int \frac{dx}{1-36x^2} =$

fórmula: $\int \frac{dv}{a^2-v^2} = \frac{1}{2a}\ln\left|\frac{v+a}{v-a}\right| + c$

$\frac{1}{6}\int \frac{d(6x)}{1^2(6x)^2}$

$\frac{1}{6}\cdot\frac{1}{2}\ln\left|\frac{6x+1}{6x-1}\right| + c$

R= $\boxed{\int \frac{1}{12}\ln\left|\frac{6x+1}{6x-1}\right| + c}$

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11.- $\int \frac{dx}{\sqrt{49x^2-4}}$

fórmula: $\int \frac{dv}{\sqrt{v^2 \pm a^2}} \ln|v + \sqrt{v^2 \pm a^2}| + c$

$\frac{1}{7}\int \frac{d(7x)}{\sqrt{(7x)^2-4}}$

R= $\boxed{\frac{1}{7}\ln|7x + \sqrt{49x^2-4}| + c}$

12.- $\int \frac{dx}{4x^2-1} =$

fórmula: $\int \frac{dv}{v^2-a^2} = \frac{1}{2a}\ln\left|\frac{v-a}{v+a}\right|$

$= \frac{1}{2}\int \frac{2dx}{4x^2-1}$

$v^2 = 4x^2$ $a^2 = 1$

$\frac{1}{2}\left(\frac{1}{2(1)}\right)\ln\left|\frac{2x-1}{2x+1}\right| + c$

$v = 2x$ $a = 1$

$dv = 2dx$

R= $\boxed{\frac{1}{4}\ln\left|\frac{2x-1}{2x+1}\right| + c}$

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13.- $\int \sqrt{1-9x^2}\,dx =$

fórmula: $\int \sqrt{a^2-v^2}\,dv = \frac{v}{2}\sqrt{a^2-v^2} + \frac{a^2}{2}\operatorname{arc\,sen}\frac{v}{a}$

$\int \frac{1}{3}\int \sqrt{1-9x^2}\,3dx$

$v^2 = 9x^2$ $a^2 = 1$

$v = 3x$ $a = 1$

$dv = 3xd$

$= \frac{1}{3}\left(\frac{3x}{2}\sqrt{1-9x^2} + \frac{1}{2}\operatorname{arc\,sen}\frac{3x}{1} + c\right.$

R= $\boxed{\frac{x}{2}\sqrt{1-9x^2} + \frac{1}{6}\operatorname{arc\,sen}\frac{3x}{1} + c}$

14.- $\int \frac{dx}{\sqrt{4x^2-9}}$

fórmula: $\int \frac{dv}{\sqrt{v^2 \pm a^2}} = \ln|v + \sqrt{v^2 \pm a^2}| + c$

$\frac{1}{2}\int \frac{d(2x)}{\sqrt{(2x)^2-9}}$

R= $\boxed{\frac{1}{2}\ln|2x + \sqrt{4x^2-9}| + c|}$

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15.- $\int \frac{dx}{16x^2-25} =$

fórmula: $\int \frac{dv}{v^2-a^2} = \frac{1}{2a}\ln\left|\frac{v-a}{v+a}\right|$

$= \frac{1}{4}\int \frac{4dx}{16x^2-25}$

$v^2 = 16x^2$ $a^2 = 25$

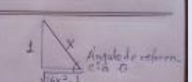
$= \frac{1}{4}\left(\frac{1}{2(5)}\right)\ln\left|\frac{4x-5}{4x+5}\right| + c$

$v = 4x$ $a = 5$

$dv = 4dx$

R= $\boxed{\frac{1}{40}\ln\left|\frac{4x-5}{4x+5}\right| + c}$

16.- $\int \frac{dx}{4x^2\sqrt{16x^2-1}}$




$\tan\theta \frac{1}{\sqrt{16x^2-1}}$

$\operatorname{sen}\theta^2\left(\frac{1}{4x}\right)^2 \to \operatorname{sen}^2\theta = \frac{1}{16}$

$x = \frac{1}{\operatorname{sen}\theta} = \operatorname{cosec}\theta$

$\frac{dx}{d\theta} = \operatorname{cosec}\theta$

$dx = -\csc\theta\cot\theta\,d\theta$

$\int \operatorname{sen}^2\theta\tan\theta - \csc\theta\cdot\cot\theta\,d\theta$

$-\int \frac{\operatorname{sen}^2\theta}{1}\cdot\frac{\operatorname{sen}\theta}{\cos\theta}\cdot\frac{1}{\operatorname{sen}}\cdot\frac{\cos\theta}{\operatorname{sen}\theta}$

$-\int \operatorname{sen}\theta\,d\theta$

$-(-\cos\theta + c) = \cos\theta + c$

$\cos\theta\ \frac{\sqrt{16x^2-1}}{x}$

R= $\int \frac{dx}{4x^2\sqrt{16x^2-1}} = \boxed{\frac{\sqrt{x^2-1} + c}{x}}$

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